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June 26, 2007

Date of Signature

Re:	Application of:	Williams et al.
	Serial No.:	09/942,330
	Filed:	August 29, 2001
	For:	Arrangement and Method for Abating Effluent from a Process
	Group Art Unit:	1763
	Examiner:	Rudy Zervigon
	Our Docket No.:	01-330 (1003-0607)

**TRANSMITTAL OF AMENDED APPEAL BRIEF**

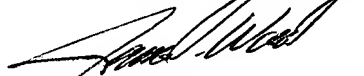
Please find for filing in connection with the above patent application the following documents:

1. Amended Appeal Brief; and
2. One (1) return post card.

In compliance with MPEP 1204.01, we ask that the Commissioner apply the previously paid appeal fee to the Appeal Brief herewith, as no final Board decision has been made on the Appeal filed May 2, 2005. However, please charge any deficiency, or credit any overpayment to Deposit Account No. 13-0014, but not to include any payment of issue fees.

Respectfully Submitted,

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June 26, 2007

Enclosures



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

MMB Docket No.: 01-330 (1003-0607)

Confirmation No.: 7713

Application of: Williams et al.

Group Art Unit: 1763

Serial No.: 09/942,330

Examiner: Rudy Zervigon

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For: Arrangement and Method for Abating Effluent from a Process

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**AMENDED APPEAL BRIEF**

Sir:

This is an appeal under 37 CFR § 41.37 to the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office from the rejection of claims 1-14 and 21-24 of the above-identified patent application. These claims were indicated as rejected in an Office Action dated May 10, 2006. The \$500.00 fee required under 37 CFR § 41.20(b)(2) has previously been paid. (See Office Action dated May 10, 2006). Also, please provide any extensions of time that may be necessary and charge any

fees that may be due to Account No. 13-0014, but not to include any payment of issue fees.

**(1) REAL PARTY IN INTEREST**

LSI Logic Corporation is the assignee of this patent application, and the real party in interest.

**(2) RELATED APPEALS AND INTERFERENCES**

There are no appeals or interferences related to this patent application (serial no. 09/942,330).

**(3) STATUS OF CLAIMS**

Claims 1-14 and 21-26 are pending in the application. The Examiner has withdrawn claims 25 and 26 from consideration.

Claims 1-14 and 21-24 stand rejected and form the subject matter of this appeal. Claims 1-14 and 21-26 are shown in the Appendix attached to this Appeal Brief.

**(4) STATUS OF AMENDMENTS**

Appellants have filed no amendments after receipt of the May 10, 2006, Office Action (the "Office Action").

## **(5) SUMMARY OF CLAIMED SUBJECT MATTER**

Independent claim 1 is directed to a process effluent abatement arrangement that includes an enclosure, a first partition, a gas connector, a gas dispenser and an exit port. The enclosure defines an interior void. (See, for example, element 14 of Fig. 1). A first partition has a first orifice defined therein and is positioned within said interior void such that (i) the first partition divides the interior void into a first chamber and a second chamber and (ii) the first orifice is in fluid communication with said first chamber and said second chamber. Referring to Fig. 1 by way of nonlimiting example, a partition 16 divides the void 14 into a first chamber 40 and a second chamber 42. In the exemplary embodiment, the second chamber 42 has a number of subchambers 44, 46 etc. (Specification at p.8, lines 3-7). The partition 16 includes an orifice 18 that is in fluid communication with the first chamber 40 and the second chamber 42. (See Fig. 1 and specification at p.7, lines 17-20 and p.8, lines 19-21).

Referring again to the summary of claim 1, the gas connector has (i) a passageway defined therethrough and (ii) a gas port in fluid communication with the passageway. The passageway has an inlet and an outlet and is in direct fluid communication with said first chamber of the enclosure. With reference to the nonlimiting example of Fig. 1, a gas connector 68 has (i) a passageway 70 defined therethrough and (ii) a gas port 72 in fluid communication with the passageway 70. The passageway 70 includes an inlet 74 and an outlet 76. (See Fig. 1 and specification at p. 7, lines 2-5). Referring again to the general summary of the invention, the gas port is disposed downstream of the inlet and upstream of said outlet. (See e.g., the gas port 72, inlet 74 and outlet 76 of Fig. 1).

The gas dispenser is in direct fluid communication with the second chamber of the enclosure. The exit port is in fluid communication with said interior void. In the exemplary embodiment of Fig. 1, a gas dispenser 78 is in direct fluid communication with the subchamber 48 of the second chamber 42. (See Fig. 1 and specification at p.11, lines 10-16). An exit port 80 is in fluid communication with the void 14. (See Fig. 1).

Claim 2 is directed to embodiments of the invention in which the second chamber has a second partition having an orifice therein. The orifices of the first partition and second partition have central axes that are offset from one another. (See, e.g., axes 56 and 58 of orifices 28 and 30, respectively, of Fig. 1).

Claim 11 is directed to an arrangement for abating effluent that includes an enclosure, a gas connector, a gas dispenser, an exit port and an etch apparatus. The enclosure, gas connector, gas dispenser and exit port include many, but not all of the limitations of corresponding elements of claim 1. Claim 11, however, cites the following additional limitations corresponding to the etch apparatus an etch apparatus which generates an etch gas product, said etch apparatus being in fluid communication with said gas connector such that said etch gas product generated by said etch apparatus is advanced into said interior void of said enclosure. (See, e.g., element 90 of Fig. 1; Application at p.11, line 17 to p.12, line 3).

Claim 22 is directed to embodiments of the invention in which the first orifice of the first partition is aligned with the longitudinal axis of the enclosure. (See, e.g., axes 56 of orifice 28).

The additional information required by the United States Patent Office is as follows:

Claim 1

Claims 1, 2, 8 and 10 are argued together. Claim 1 is independent claim. Claim 1 recites:

1. A process effluent abatement arrangement, (see, e.g. Appellants' specification at page 1, lines 5-7, page 6, lines 15-17 and FIG. 1) comprising:

an enclosure which defines an interior void (see, e.g. Appellants' specification at page 6, lines 21-22 and FIG. 1);

a first partition having a first orifice defined therein (see, e.g. Appellants' specification at page 8, lines 19-21 and FIG. 1), said first partition being positioned within said interior void such that (i) said first partition divides said interior void into a first chamber and a second chamber (see, e.g. Appellants' specification at page 7, lines 17-20, page 8, lines 19-21 and FIG. 1) and (ii) said first orifice is in fluid communication with said first chamber and said second chamber (see, e.g. Appellants' specification at page 9, lines 19-21 and FIG. 1);

a gas connector (see, e.g. Appellants' specification at page 7, lines 2-4 and FIG. 1) which has (i) a passageway defined therethrough (see, e.g. Appellants' specification at page 7, lines 2-4 and FIG. 1) and (ii) a gas port in fluid communication with said passageway, (see, e.g. Appellants' specification at page 7, lines 2-4 and FIG. 1) said passageway (A) having an inlet and an outlet (see, e.g. Appellants' specification at page 7, lines 4-5 and FIG. 1) and (B) being in direct fluid communication with said first chamber of said enclosure (see, e.g. Appellants' specification at page 7, line 6 and FIG. 1), said gas port being downstream of said inlet and upstream of said outlet (see, e.g. Appellants' specification at FIG. 1);

a gas dispenser in direct fluid communication with said second chamber of said enclosure (see, e.g. Appellants' specification at page 7, lines 7-8 and FIG. 1); and

an exit port in fluid communication with said interior void (see, e.g. Appellants' specification at page 7, lines 8-9 and FIG. 1).

#### Claim 11

Claim 11 is argued separately. Claim 11 is independent claim. Claim 11 recites:

An arrangement for abating effluent (see, e.g. Appellants' specification at page 1, lines 5-7, page 6, lines 15-17 and FIG. 1), comprising:

an enclosure which defines an interior void (see, e.g. Appellants' specification at page 6, lines 21-22 and FIG. 1);

a gas connector (see, e.g. Appellants' specification at page 7, lines 2-4 and FIG. 1) which has (i) a passageway defined therethrough (see, e.g. Appellants' specification at page 7, lines 2-4 and FIG. 1) and (ii) a gas port in fluid communication with said passageway (see, e.g. Appellants' specification at page 7, lines 2-4 and FIG. 1), said passageway (A) having an inlet and an outlet (see, e.g. Appellants' specification at page 7, lines 4-5 and FIG. 1) and (B) being in fluid communication with said interior void of said enclosure (see, e.g. Appellants' specification at page 7, line 6 and FIG. 1);

a gas dispenser in fluid communication with said interior void of said enclosure (see, e.g. Appellants' specification at page 7, lines 7-8 and FIG. 1);

an exit port in fluid communication with said interior void of said enclosure (see, e.g. Appellants' specification at page 7, lines 8-9 and FIG. 1); and



an etch apparatus which generates an etch gas product (see, e.g. Appellants' specification at page 13, lines 8-10), said etch apparatus being in fluid communication with said gas connector such that said etch gas product generated by said etch apparatus is advanced into said interior void of said enclosure (see, e.g. Appellants' specification at page 13, lines 10-13 and FIG. 1).

#### Claim 22

Claim 22 is argued with claim 24. Claim 22 is an independent claim. Claim 22 recites:

22. A process effluent abatement arrangement (see, e.g. Appellants' specification at page 1, lines 5-7, page 6, lines 15-17 and FIG. 1), comprising:

an enclosure which defines an interior void and a longitudinal axis(see, e.g. Appellants' specification at page 6, lines 21-22, page 7, line 21 through page 8, line 3 and FIG. 1);

a first partition having a first orifice defined therein (see, e.g. Appellants' specification at page 8, lines 19-21 and FIG. 1), said first partition being positioned within said interior void such that (i) said first partition divides said interior void into a first chamber and a second chamber (see, e.g. Appellants' specification at page 7, lines 17-20, page 8, lines 19-21 and FIG. 1) and (ii) said first orifice is in fluid communication with said first chamber and said second chamber (see, e.g. Appellants' specification at page 9, lines 19-21 and FIG. 1);

a second partition having a second orifice defined therein (see, e.g. Appellants' specification at page 8, lines 3-7 and 19-20 and FIG. 1), wherein (i) said second partition

is positioned within said second chamber (see, e.g. Appellants' specification at page 8, lines 3-7 and FIG. 1), (ii) said first orifice has a first central axis that is substantially aligned with the longitudinal axis of the enclosure (see, e.g. Appellants' specification at page 9, lines 1-3, 6-11 and FIG. 1), said first central axis being unobstructed such that gas can pass from the first chamber to the second chamber through the first central axis (see, e.g. Appellants' specification at page 10, lines 3-11 and FIG. 1), (iii) said second orifice has a second central axis (see, e.g. Appellants' specification at page 9, lines 1-3, 6-11 and FIG. 1), and (iv) said second central axis of said second orifice is offset relative to said first central axis of said first orifice axis (see, e.g. Appellants' specification at page 9, lines 6-11 and FIG. 1);

a gas connector (see, e.g. Appellants' specification at page 7, lines 2-4 and FIG. 1) which has (i) a passageway defined therethrough (see, e.g. Appellants' specification at page 7, lines 2-4 and FIG. 1) and (ii) a gas port in fluid communication with said passageway (see, e.g. Appellants' specification at page 7, lines 2-4 and FIG. 1), said passageway (A) having an inlet and an outlet (see, e.g. Appellants' specification at page 7, lines 4-5 and FIG. 1) and (B) being in direct fluid communication with said first chamber of said enclosure (see, e.g. Appellants' specification at page 7, line 6 and FIG. 1);

a gas dispenser in direct fluid communication with said second chamber of said enclosure (see, e.g. Appellants' specification at page 7, lines 7-8 and FIG. 1); and

an exit port in fluid communication with said interior void (see, e.g. Appellants' specification at page 7, lines 8-9 and FIG. 1).

**(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

Claims 1-6, 8, 10, and 21-24 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 4,311, 671 to Notman (hereinafter “Notman”) in view of U.S. Patent No. 4,747,367 to Posa (hereinafter “Posa”).

Claims 7 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,137,701 to Mundt (hereinafter “Mundt”) in view of Notman and Posa.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Notman and Posa in further view of U.S. Patent No. 5,384,051 to McGinness (hereinafter “McGinness”).

Claims 12-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Notman, Posa, Mundt and McGinness.

**(7) ARGUMENT**

**SECTION 1**-Arguments for Claims 1-6, 8, 10, and 21-24 rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 4,311, 671 to Notman (hereinafter “Notman”) in view of U.S. Patent No. 4,747,367 to Posa (hereinafter “Posa”).

**Claims 1, 2, 8 and 10 (argued as a first group) are Not Obvious  
Over Notman in View of Posa**

*Discussion re: Patentability of Claim 1*

1. Claim 1

Claim 1 stands rejected as allegedly being unpatentable over Notman in view of Posa. Claim 1 includes the following limitations:

a gas connector which has (i) a passageway defined therethrough and (ii) a gas port in fluid communication with said passageway, said passageway (A) having an inlet and an outlet and

(B) being in direct fluid communication with said first chamber of said enclosure, said gas port being downstream of said inlet and upstream of said outlet;

Thus, claim 1 recites a gas connector that has a passageway with an inlet and an outlet, and that also has a gas port in fluid communication with the passageway. The gas port is downstream of the inlet and upstream of the outlet.

Claim 1 is *not* obvious over Notman in view of Posa because there is no motivation or suggestion to modify Notman as proposed by the Examiner.

2. No Motivation to Modify Notman

In the rejection of claim 1, the Examiner admitted that Notman failed to teach the claim limitation of a “gas port being downstream of said inlet and upstream of said outlet.” The Examiner relied upon Posa for showing the element missing from Notman. The proposed motivation for the modification of Notman, however, is not legally sufficient.

In particular, the Examiner has alleged that the motivation to modify Notman would be for the purpose of “adding plural reactive gas source inlets.” Office Action at page 5. To provide a convincing line of reasoning for the modification of Notman with the device of Posa, however, the Examiner must show why an artisan of ordinary skill in the art would be motivated to include plural reactive gas source inlets in the system of Notman. This is particularly troublesome since the system of Notman uses catalyst beds to generate the desired chemical reactions, not a reactive gas. (See, e.g., Notman at column 4, lines 18-24). Accordingly, an artisan of ordinary skill in the art would not make provision for the addition of a reactive gas, knowing that reactive gas would not be

used.

Therefore, the Examiner has failed to provide a convincing line of reasoning. Because the Examiner has failed to provide a convincing line of reasoning as required by MPEP § 2144, citing to *Ex parte Clapp*, 227 USPQ 972 (Bd. Pat. App. & Inter. 1985), the Examiner has failed to provide a *prima facie* case of obviousness. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 1.

2. The Proposed Modification Changes a Principle of Operation

Moreover, because the suggested combination of references would require a change in the basic principle under which the Notman device was designed to operate, there is no motivation for the proposed combination.

Specifically, the Notman device is a synthesis reactor. (Notman at title). The Notman device operates based upon the principle that passing a gas (e.g. a mixture of hydrogen, carbon monoxide and carbon dioxide) over a catalyst bed of solid material (e.g. copper and zinc oxide) will produce a chemical reaction generating a desired output (e.g. methanol). (Notman at column 4, lines 9-44). Thus, in Notman, a mixture of gas is introduced to a solid catalyst bed to obtain a preferred gaseous output.

In contrast, Posa is directed to a vapor deposition device with a constant flow of gas at a constant pressure into a process reaction (deposition) chamber. (Posa at Abstract). Thus, when producing a deposition, the device of Posa mixes a reactive gas with a carrier gas that is directed into the process reaction chamber while a non-reactive gas is vented. (Posa at column 9, lines 23-27 and FIGs. 7 and 8). When the deposition is completed, the device of Posa switches the position of the manifold 22 which causes the

non-reactive gas to be mixed with the carrier gas and directed into the process reaction chamber while the reactive gas is vented. (Posa at column 9, lines 27-34 and FIGs. 7 and 8). Thus, in Posa, a mixture of gas is introduced to a reaction chamber to obtain a solid deposition.

Accordingly, while the exact process which the Examiner proposes to be used in the modified Notman device is not clear, whatever ultimate design the Examiner intends must include a fundamental change in the basic principle of operation of Notman, such as by replacing the catalyst bed with the reactive gas and/or generating a solid output in place of the gaseous output of Notman. In either event, because Notman and Posa are fundamentally different devices with fundamentally different functions, the proposed modification would require a change in the basic principle under which the Notman device was designed to operate. Therefore, there is no motivation for the proposed combination. *In re Ratti*, 270 F.2d 810, 813, 123 USPQ 349, 352 (CCPA 1959).

### 3. Conclusion

For some or all of the above reasons, there is no motivation for the proposed modification of Notman with the manifold of Posa. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 1.

### *Discussion re: Patentability of Claims 2, 8 and 10*

Claims 2, 8 and 10 also stand rejected as allegedly being unpatentable over Notman in view of Posa. Claims 2, 8 and 10 all depend from and incorporate all of the limitations of claim 1. Accordingly, for at least the same reasons as those set forth above

in connection with claim 1, it is respectfully submitted that claims 2, 8 and 10 are patentable over the prior art.

**Claims 3-6 (argued as a second group) are Not Obvious  
Over Notman in View of Posa**

*Discussion re: Patentability of Claims 3-6*

Claims 3-6 all stand rejected as allegedly being unpatentable over Notman in view of Posa. For a plurality of independent reasons, it is submitted that the rejections of claims 3-6 should be reversed.

1. The Arguments Made With Respect to Claim 1 Apply

Claims 3-6 all depend from and incorporate all the limitations of claim 1.

Accordingly, as an initial matter, the rejection of claims 3-6 should be reversed for at least the same reasons as those set forth above in connection with claim 1.

2. Subdivisions are Not Mere Duplication

In addition, claims 3-6 contain further limitations directed to additional partitions in the enclosure. The Examiner alleged that the additional partitions would have been an obvious modification of Notman. To this end, the Examiner appears to allege that the motivation to add additional partitions in Notman is that "it is well established that the duplication of parts is obvious". (Office Action at p.6). However, a mere duplication of parts is not claimed. The division of a second chamber into (at least) six subcompartments is claimed. This is not a mere duplication of parts, but rather a significant subdivision of an existing structure. There is no motivation or suggestion to

add more partitions to Notman to create six subcompartments in a second chamber.

Thus, in addition to the reasons as those set forth above in connection with claim 1, the obviousness rejection of claims 3-6 should be reversed.

3. Conclusion

For some or all of the above reasons, claims 3-6 are patentable over the cited prior art. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claims 3-6.

**Claim 21 (argued separately) is Not Obvious  
Over Notman in View of Posa**

1. The Arguments Made With Respect to Claim 1 Apply

Claim 21 stands rejected as allegedly being obvious over Notman. As an initial matter, claim 21 depends (indirectly) from and incorporates all the limitations of claim 1. In particular, claim 21 depends from claim 2 which in turn depends from claim 1. Accordingly, for at least those reasons set forth above in connection with claim 1, it is respectfully submitted that the rejection of claim 21 is in error and should be reversed.

2. Additional Limitations of Claim 21

Claim 21 depends from claim 2 which recites a second partition in the enclosure, as well as a second orifice in the second partition, the second orifice having a central axis that is offset with respect to the central axis of the first orifice. Claim 21 further recites the following limitations:

said first orifice comprises a largest orifice in said first partition, and said second orifice



comprises a largest orifice in said second partition.

As a consequence, the first orifice is the largest orifice of the first partition and has a central axis that is offset from the central axis of the largest orifice of the second partition.

3. Notman Does Not Teach or Suggest Partitions with Offset Orifices

Notman does not disclose a device having first and second partitions having offset largest orifices. In particular, the Examiner has alleged that the first and second partitions of Notman are the webs 16A/B. The Examiner admitted, however, that “Notman does not teach that his first and second orifice comprise the largest orifice in his first and second partitions respectively such that the central axis of the first and second orifice are offset relative to each other.” (Second Office Action at p.5).

The Examiner contended, nevertheless, that:

It would have been obvious to one of ordinary skill in the art . . . to optimize the dimension of Notman’s orifice in each of the first and second partitions such that the largest orifice of each partition produce axis that are offset relative to each other. . .

Motivation . . . to optimize the dimension of Notman’s orifice in each of the first and second partitions such that the largest orifice of each partition produce axis that are offset relative to each other, . . . is to provide for longer residence time for the flowing gasses (column 3, lines 7-8; column 4, lines 12-17).

(Office Action at pp.5-6). Applicants submit that the Examiner has not alleged a legally sufficient motivation or suggestion to modify Notman’s device to include largest orifices in the two partitions that have offset central axes.

First, contrary to the Examiner’s assertions, Notman does not suggest the desirability of providing longer residence time for the flowing gasses. Second, and perhaps more importantly, Notman does not suggest that the use of partitions having

offset largest orifices would provide longer gas residence time.

With regard to the desirability of providing longer residence time, the Examiner cited Notman at columns 3 and 4. (Office Action at p.6). The passages cited by the Examiner as providing support for this proposition are set forth below:

... united. More than two subdivisions can be provided, but at the cost of some complexity in piping.

...

... higher pressures. The volume space velocity through the total catalyst is suitably in the range of 5000-50,000 hour<sup>-1</sup>. The gas passed over the catalyst is normally a mixture of fresh synthesis gas and unreacted gas recycled from methanol recovery by cooling, condensation and separation.

(Notman at col. 3, lines 7-8 and col. 4, lines 12-17).

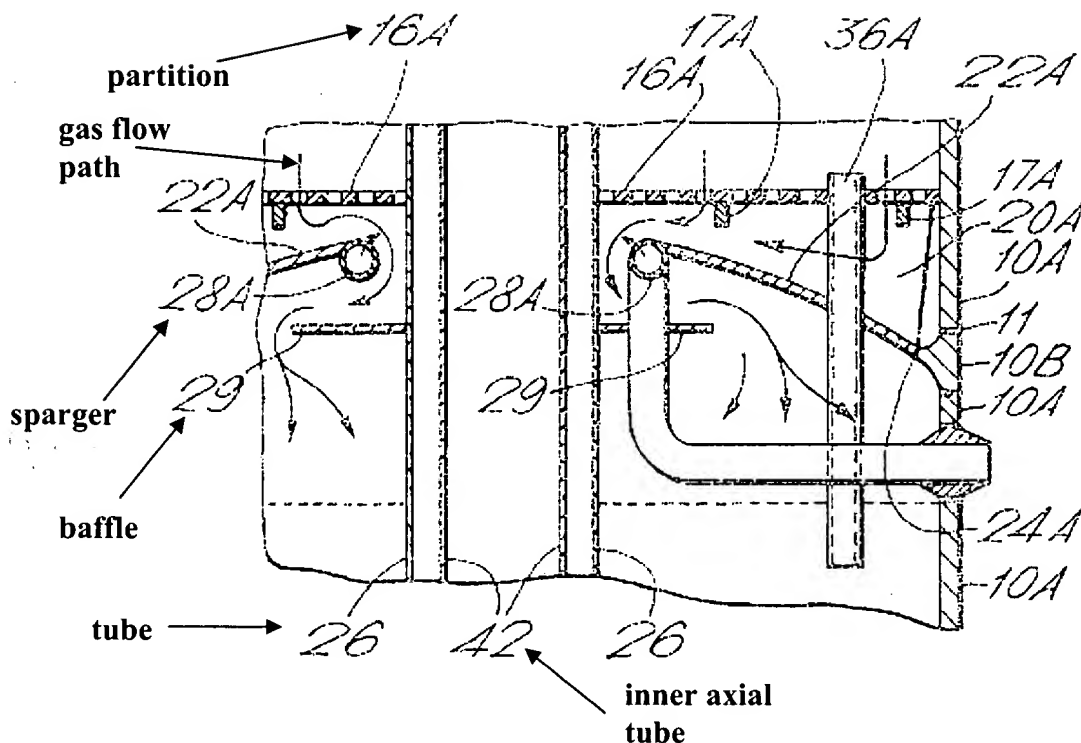
Nowhere in the above cited passages is there any remote implication that there is a desire to increase gas residence time. There certainly is no teaching or suggestion in the prior art that positioning two large orifices in partitions such that they are offset with respect to each other constitutes a desirable or efficient manner to increase gas residence time.

Moreover, the configuration of the Notman device is such that a constraint as to the location of hole in one partition with respect to a hole in the next partition is of no consequence. Specifically, all of the gas that passes through the catalyst bed and the partition 16A is directed to the spargers 28A located next to the tube 26. (Notman at column 8, lines 17-20 and FIG. 3).<sup>1</sup> Thus, regardless of the location of a hole in the partition 16a through which gas passes, the gas must first travel past the spargers 28A before traveling to the next partition. This is shown in FIG. 3, a portion of which is set

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<sup>1</sup> Notman includes typographical error identifying the spargers by reference number "36". This error is obvious since the catalyst emptying pipes 36A, 36B and 36C are identified at column 7, lines 22-23 and the reference number 28A is used to identify a sparger at column 7, lines 51-53.

forth below.



The baffle 29 then distributes the gas over the next catalyst bed. (Notman at column 8, lines 21-23 and FIG. 1). Thus, the relative alignment of holes in the partition 16A with respect to the partition 16B has no affect on residence time since all gas passing through the partition 16A must travel around the spargers 28A and over the baffle 29 before encountering the partition 16B.

Rather, providing a single "largest" hole in a partition would most likely degrade the performance of the catalyst bed since the reduced resistance to flow through the larger hole would cause gas to preferentially flow through that hole, causing an increased amount of reaction in the catalyst bed near the hole. The locally increased reactions would lead to localized burnout of the catalyst bed near the largest hole. Of course, once burnout about the largest hole occurs, the catalyst bed must be replaced even though

catalyst located near the other holes in the partition would still be active. This results in decreased catalyst bed life, increased costs and increased maintenance requirements.

Accordingly, one of ordinary skill in the art would *not* be motivated to provide a “largest” hole in the partitions of Notman.

Therefore, the Examiner has failed to provide a convincing line of reasoning for the proposed modification. Because the Examiner has failed to provide a convincing line of reasoning as required by MPEP § 2144, citing to *Ex parte Clapp*, 227 USPQ 972 (Bd. Pat. App. & Inter. 1985), the Examiner has failed to provide a *prima facie* case of obviousness. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 21.

3. Conclusion

For some or all of the above reasons, claim 21 is patentable over the cited prior art. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claim 21.

**Claims 22 and 24 (argued as a third group) are Not Obvious  
Over Notman in View of Posa**

*Discussion re: Patentability of Claim 22*

1. Claim 22

Claim 22 also stands rejected as allegedly being unpatentable over Notman in view of Posa. Claim 22 includes the following limitations:

a first partition having a first orifice defined therein, said first partition being positioned

within said interior void such that (i) said first partition divides said interior void into a first chamber and a second chamber and (ii) said first orifice is in fluid communication with said first chamber and said second chamber

.....

said first orifice has a first central axis that is substantially aligned with the longitudinal axis of the enclosure, . . . such that gas can pass from the first chamber to the second chamber through the first central axis,

Thus, the orifice in the first partition is centrally located, or “aligned with the longitudinal axis” of the enclosure, and has a first central axis. Additionally, gas passes from the first chamber to the second chamber through the first central axis, or in other words, through the centrally-located first orifice.

2. The Rejection of Claim 22 is in Error

Notman does not disclose a first orifice as recited in claim 22. In the Office Action, the Examiner alleged that the catalyst beds 12A and 12B of Notman constitute the claimed first and second chambers while the grid 16a was a first partition as claimed and that it has a first orifice (“central hole”) that constitutes the first orifice (Office Action, page 3). This central hole is the opening through which the tubes 26 and 42 pass. (See Notman, FIG. 1, reproduced on page 17 of this brief). Thus, the Examiner alleges that gas passes from the catalyst bed 12A to the catalyst bed 12B through the tubes 26 and/or 42. The Examiner has mischaracterized the nature of the tubes 26 and 42.

In particular, the Examiner alleged that the “first orifice has a first central axis (collinear to central axis of 42) and being aligned (colinear) with the longitudinal axis of the enclosure, the first central axis is further *unobstructed* such that gas can pass (see flow arrows) from the first chamber to the second chamber through the first central axis.”

(Office Action at p.4) (emphasis added). In other words, the Examiner appears to be alleging that gas may freely pass from the chamber 12A to the chamber 12B through the tubes 26 and 42. Contrary to the Examiner's assertion, the tubes 26 and 42 are used to direct gas that has been passed through the catalyst bed 12C up to the heat exchanger 40. (Notman at column 7, lines 32-39). To this end, while gas passes through the tubes 26 and 42, the tubes 26 and 42 do not have openings into either of the catalyst beds 12A and 12B. Rather, the tubes 26 and 42 extend from the large catalyst bed 14 to the heat exchanger 40. This is corroborated by the fact that the arrows of Notman in FIG. 3 clearly show the flow of gas between the chamber 12A and the chamber 12B does not pass through the tubes 26 and 42.

Instead, gas *only* passes from the first chamber (catalyst bed 12a) to the second chamber (catalyst bed 12b) through off-center holes 16a. These off-center holes are not aligned with the longitudinal axis of the enclosure. (See Notman, FIG. 1 and FIG. 3). Gas passing into and/or out of the tubes 26 and 42 from the catalyst bed 12a would completely destroy the circulation pattern in the Notman device.

Accordingly, Notman fails to teach or suggest a first orifice in communication with the first and second chambers, and which has a central axis aligned with a longitudinal axis of the enclosure where gas passes unobstructed along the central axis from the first chamber to the second chamber as claimed. For at least this reason, it is respectfully submitted that the Examiner has failed to set forth a *prima facie* case of obviousness with respect to claim 22 and thus the rejection of claim 22 as allegedly being obvious over Notman is in error and should be reversed.

*Discussion re: Patentability of Claim 24*

Claim 24 also stands rejected as allegedly being obvious over Notman. Claim 24 depends from and incorporates all of the limitations of claim 22. Accordingly, for at least the same reasons as those set forth above in connection with claim 22, it is respectfully submitted that the rejection of claim 24 is in error and should be reversed.

**Claim 23 (argued separately) is Not Obvious  
Over Notman in View of Posa**

1. The Arguments Made With Respect to Claim 22 Apply

As an initial matter, claim 23 depends from and incorporates all the limitations of claim 22. Accordingly, claim 23 is patentable over the prior art for at least the same reasons as those set forth above in connection with claim 22.

2. The Arguments Made With Respect to Claim 1 Apply

Claim 23 further recites the following limitation:

the gas port is disposed between the inlet and the outlet of the passageway

Accordingly, claim 23 adds a limitation similar to that discussed above in connection with claim 1. Therefore, for the same reasons set forth above with respect to claim 1, there is no motivation for the proposed modification of Notman.

3. Conclusion

For some or all of the above reasons, claim 23 is patentable over the cited prior art. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claim 23.

**SECTION 2-** Arguments for Claims 7 and 11 rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,137,701 to Mundt (hereinafter “Mundt”) in view of Notman and Posa.

**Claim 7 (argued separately) is Not Obvious Over Mundt  
in View of Notman and Posa**

1. The Argument of Claim 1 Applies

As an initial matter, claim 7 depends from and incorporates all the limitations of claim 1. While the rejection of claim 7 is over Mundt in view of Notman and Posa, Mundt does not overcome the deficiencies of Notman and Posa with respect to claim 1, discussed above. Accordingly, claim 7 is patentable over the prior art for at least the same reasons as those set forth above in connection with claim 1.

2. The Examiner’s Rejection of Claim 7

Claim 7 further recites the following limitations:

an etch apparatus which generates an etch gas product, said etch apparatus being in fluid communication with said gas connector such that said etch gas product generated by said etch apparatus is advanced into said interior void of said enclosure.



The Examiner rejected claim 7 as allegedly being obvious over Mundt in view of Notman and Posa. The Examiner admitted that Notman and Posa do not teach the claimed etch apparatus. Instead, the Examiner contended that it would have been obvious to replace Mundt's process effluent abatement arrangement with the catalytic gas reactor of Notman. (Office Action at p.8).

In particular, the Examiner cited the following reasoning for modifying the process effluent abatement arrangement of Mundt:

Motivation to replace Mundt's process effluent abatement arrangement with Alan Notman's catalytic gas reactor to process the effluent from Mundt's etch apparatus is to reduce the hazardous process chemicals from the etch reactor as taught by Mundt (column 1, lines 22-33).

(Office Action at p.8).

3. The Examiner Has Not Identified a Legally Sufficient Motivation to Combine

The above-quoted paragraph does not establish a legally sufficient motivation or suggestion to modify Mundt as proposed by the Examiner. Applicants respectfully submit that Mundt does not suggest that a catalytic converter of the type disclosed in Notman would reduce hazardous process chemicals. The passages of Mundt cited by the Examiner in support of this proposition are set forth below:

One example of a technology which may readily implement the present invention is the semiconductor fabrication industry. This industry is making increased use of low pressure operations such as plasma etching, plasma assisted deposition and the like. these processes require sophisticated vacuum pumping systems having expensive parts and often using expensive, inert pump oil. Since corrosive gases are utilized in these processes, the unreacted gases or the reaction by-products of these gases can be harmful to the pump system; it is thus desirable that they be treated prior to their passage into the pump mechanism. Presently, the treatment of these materials is done in two ways.

(Mundt at col. 1, lines 22-33).

The above-cited portions of Mundt do not suggest that the effluent abatement

arrangement taught by Mundt should be replaced at all, much less replaced by the catalytic converter taught by Notman. Mundt adequately describes a reaction chamber specially designed for use in the abatement of effluents in an etch apparatus. (See *id.* at cols. 5 and 6). Nothing in Mundt suggests replacing this reaction chamber with a different structure that has otherwise been designed for a different purpose.

In particular, Notman is directed to a device used for the exothermic synthesis of ammonia or methanol. (Notman at col. 1, lines 4-6). Nothing in Mundt suggests a device that performs exothermic synthesis of ammonia or methanol would be an adequate replacement for the reaction chamber of Mundt, much less a desirable replacement.

Accordingly, the Examiner has not set forth a legally sufficient motivation or suggestion to replace the effluent abatement apparatus of Mundt with the exothermic synthesis reactor of Notman. For at least this reason, the obviousness rejection of claim 7 is in error and should be reversed.

4. Conclusion

For any or all of the above reasons, the obviousness rejection of claim 7 is in error and should be reversed.

**Claim 11 (argued separately) is Not Obvious Over Mundt  
in View of Notman and Posa**

Claim 11 is an independent claim directed to an arrangement for abating effluent that includes an enclosure, a gas connector, a gas dispenser, an exit port and an etch apparatus. The enclosure, gas connector, gas dispenser and exit port include many, but

not all of the limitations of corresponding elements of claim 1. Claim 11, however, cites the following additional limitations corresponding to the etch apparatus:

an etch apparatus which generates an etch gas product, said etch apparatus being in fluid communication with said gas connector such that said etch gas product generated by said etch apparatus is advanced into said interior void of said enclosure.

For purposes of this appeal, this is the same etch apparatus discussed above with respect to claim 7.

The Examiner rejected claim 11 as allegedly being obvious over Mundt in view of Notman and Posa based upon the same proposed motivation discussed above with respect to claim 7. Accordingly, for the same reason set forth above with respect to the lack of motivation to combine Mundt, Notman and Posa with respect to claim 7, the Examiner has not set forth a legally sufficient motivation or suggestion to replace the effluent abatement apparatus of Mundt with the exothermic synthesis reactor of Notman. For at least this reason, the obviousness rejection of claim 11 is in error and should be reversed.

**SECTION 3-** Arguments for Claim 9 rejected under 35 U.S.C. § 103(a) as being unpatentable over Notman and Posa in further view of U.S. Patent No. 5,384,051 to McGinness (hereinafter "McGinness").

Claim 9 depends from and incorporates all the limitations of claim 1. Claim 9 was rejected based primarily upon Notman and Posa with further reference to McGuinness for the limitations added by claim 9. Accordingly, even if Notman and Posa are modified in the manner suggested by the Examiner, such modification fails to overcome the deficiencies of Notman and Posa with respect to claim 1, discussed above. Accordingly, claim 9 is patentable over the prior art for at least the same reasons as those set forth

above in connection with claim 1.

**SECTION 4-** Arguments for Claims 12-14 rejected under 35 U.S.C. § 103(a) as being unpatentable over Notman, Posa, Mundt and McGuinness.

**Claims 12-14 (argued as a group) are Not Obvious  
Over Notman in View of Posa, Mundt and McGuinness**

Claims 12-14 stand rejected over Mundt in view of Notman and Posa in further view of McGuinness. Claims 12-14 all depend from and incorporate all of the limitations of claim 11. Claims 12-14 were rejected based primarily upon Mundt, Notman and Posa with further reference to McGuinness for the limitations added by claims 12-14. As discussed above, there is no legally sufficient motivation or suggestion to combine Mundt, Notman and Posa as proposed by the Examiner. McGuinness does not supply the missing motivation or suggestion. Accordingly, for at least the same reasons as those set forth above in connection with claim 11, it is respectfully submitted that claims 12-14 are patentable over the prior art.

## CONCLUSION

Claims 1-14 and 21-24 are not unpatentable under 35 U.S.C. § 103(a) as being obvious. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claims 1-14 and 21-24.

Respectfully submitted,

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**(8) CLAIMS APPENDIX**

1. A process effluent abatement arrangement, comprising:

an enclosure which defines an interior void;

a first partition having a first orifice defined therein, said first partition being positioned within said interior void such that (i) said first partition divides said interior void into a first chamber and a second chamber and (ii) said first orifice is in fluid communication with said first chamber and said second chamber;

a gas connector which has (i) a passageway defined therethrough and (ii) a gas port in fluid communication with said passageway, said passageway (A) having an inlet and an outlet and (B) being in direct fluid communication with said first chamber of said enclosure, said gas port being downstream of said inlet and upstream of said outlet;

a gas dispenser in direct fluid communication with said second chamber of said enclosure; and

an exit port in fluid communication with said interior void.

2. The arrangement of claim 1, further comprising:

a second partition having a second orifice defined therein,

wherein (i) said second partition is positioned within said second chamber, (ii) said first orifice has a first central axis, (iii) said second orifice has a second central axis, and (iv) said second central axis of said second orifice is offset relative to said first central axis of said first orifice.

3. The arrangement of claim 2, further comprising:

- a third partition having a third orifice defined therein;
- a fourth partition having a fourth orifice defined therein;
- a fifth partition having a fifth orifice defined therein; and
- a sixth partition having a sixth orifice defined therein,

wherein said second partition, said third partition, said fourth partition, said fifth partition, and said sixth partition are all positioned within said second chamber such that said second chamber is divided into a first sub-chamber, a second sub-chamber, a third sub-chamber, a fourth sub-chamber, a fifth sub-chamber, and a sixth sub-chamber.

4. The arrangement of claim 3, wherein:

each of said first partition, said second partition, said third partition, said fourth partition, said fifth partition, and said sixth partition are spaced apart along a longitudinal axis of said enclosure so that said longitudinal axis passes through a center point  $P_1$  of said first partition, a center point  $P_2$  of said second partition, a center point  $P_3$  of said third partition, a center point  $P_4$  of said fourth partition, a center point  $P_5$  of said fifth partition, and a center point  $P_6$  of said sixth partition, and

said second partition is positioned adjacent to said first partition such that (i) said first sub-chamber is interposed said first partition and said second partition and (ii) said first orifice is in direct fluid communication with said first chamber and said first sub-chamber,

said third partition is positioned adjacent to said second partition such that (i) said second sub-chamber is interposed said second partition and said third partition and (ii)

said second orifice is in direct fluid communication with said first sub-chamber and said second sub-chamber,

said fourth partition is positioned adjacent to said third partition such that (i) said third sub-chamber is interposed said third partition and said fourth partition and (ii) said third orifice is in direct fluid communication with said second sub-chamber and said third sub-chamber,

said fifth partition is positioned adjacent to said fourth partition such that (i) said fourth sub-chamber is interposed said fourth partition and said fifth partition and (ii) said fourth orifice is in direct fluid communication with said third sub-chamber and said fourth sub-chamber,

said sixth partition is positioned adjacent to said fifth partition such that (i) said fifth sub-chamber is interposed said fifth partition and said sixth partition and (ii) said fifth orifice is in direct fluid communication with said fourth sub-chamber and said fifth sub-chamber, and

an end wall of said enclosure is positioned adjacent to said sixth partition such that (i) said sixth sub-chamber is interposed said end wall and said sixth partition and (ii) said sixth orifice is in direct fluid communication with said fifth sub-chamber and said sixth sub-chamber.

5. The arrangement of claim 4, wherein:

said third orifice has a third central axis and said third central axis of said third orifice is offset relative to said second central axis of said second orifice,



said fourth orifice has a fourth central axis and said fourth central axis of said fourth orifice is offset relative to said third central axis of said third orifice,

said fifth orifice has a fifth central axis and said fifth central axis of said fifth orifice is offset relative to said fourth central axis of said fourth orifice, and

said sixth orifice has a sixth central axis and said sixth central axis of said sixth orifice is offset relative to said fifth central axis of said fifth orifice.

6. The arrangement of claim 5, wherein:

said longitudinal axis divides said enclosure into a first half and a second half,

said first central axis of said first orifice is aligned with said longitudinal axis,

said second orifice of said second partition, said fourth orifice of said fourth partition, and said sixth orifice of said sixth partition are located within said first half of said enclosure, and

said third orifice of said third partition and said fifth orifice of said fifth partition are located within said second half of said enclosure.

7. The arrangement of claim 1, further comprising:

an etch apparatus which generates an etch gas product, said etch apparatus being in fluid communication with said gas connector such that said etch gas product generated by said etch apparatus is advanced into said interior void of said enclosure.

8. The apparatus of claim 1, further comprising:

a gas source containing a gas, said gas source being in fluid communication with said gas port of said gas connector such that said gas contained by said gas source is advanced into said passageway of said gas connector.

9. The apparatus of claim 8, further comprising:

an electrical heating element which is in thermal communication with said gas provided by said gas source so that said gas is heated prior to being advanced into said passageway of said gas connector.

10. The apparatus of claim 1, further comprising:

a humidified gas source for providing a humidified gas, said humidified gas source being in fluid communication with said gas dispenser such that said humidified gas is advanced into said gas dispenser and into said second chamber of said enclosure.

11. An arrangement for abating effluent, comprising:

an enclosure which defines an interior void;

a gas connector which has (i) a passageway defined therethrough and (ii) a gas port in fluid communication with said passageway, said passageway (A) having an inlet and an outlet and (B) being in fluid communication with said interior void of said enclosure;

a gas dispenser in fluid communication with said interior void of said enclosure;

an exit port in fluid communication with said interior void of said enclosure; and

an etch apparatus which generates an etch gas product, said etch apparatus being in fluid communication with said gas connector such that said etch gas product generated by said etch apparatus is advanced into said interior void of said enclosure.

12. The arrangement of claim 11, further comprising:

a gas source containing a gas, said gas source being in fluid communication with said gas port of said gas connector such that said gas contained by said gas source is advanced into said passageway of said gas connector; and

a heating element which is in thermal communication with said gas provided by said gas source so that said gas is heated prior to being advanced into said passageway of said gas connector.

13. The arrangement of claim 12, further comprising:

a humidified gas source for providing a humidified gas, said humidified gas source being in fluid communication with said gas dispenser such that said humidified gas is advanced into said gas dispenser and into said interior void of said enclosure.

14. The arrangement of claim 13, further comprising:

a first partition having a first orifice defined therein, said first partition being positioned within said interior void of said enclosure such that (i) said first partition divides said interior void into a first chamber and a second chamber and (ii) said first orifice is in fluid communication with said first chamber and said second chamber; and

a second partition having a second orifice defined therein, wherein (i) said gas connector is in fluid communication with said interior void such that said etch gas

product generated by said etch apparatus is advanced directly into said first chamber of said interior void, (ii) said second partition is positioned within said second chamber of said interior void, (iii) said gas dispenser is in fluid communication with said interior void such that said humidified gas is advanced directly into said second chamber of said interior void, (iv) said first orifice has a first central axis, (v) said second orifice has a second central axis, and (vi) said second central axis of said second orifice is offset relative to said first central axis of said first orifice.

21. The arrangement of claim 2, wherein said first orifice comprises a largest orifice in said first partition, and said second orifice comprises a largest orifice in said second partition.

22. A process effluent abatement arrangement, comprising:

- an enclosure which defines an interior void and a longitudinal axis;
- a first partition having a first orifice defined therein, said first partition being positioned within said interior void such that (i) said first partition divides said interior void into a first chamber and a second chamber and (ii) said first orifice is in fluid communication with said first chamber and said second chamber;

- a second partition having a second orifice defined therein, wherein (i) said second partition is positioned within said second chamber, (ii) said first orifice has a first central axis that is substantially aligned with the longitudinal axis of the enclosure, said first central axis being unobstructed such that gas can pass from the first chamber to the second chamber through the first central axis, (iii) said second orifice has a second

central axis, and (iv) said second central axis of said second orifice is offset relative to said first central axis of said first orifice;

a gas connector which has (i) a passageway defined therethrough and (ii) a gas port in fluid communication with said passageway, said passageway (A) having an inlet and an outlet and (B) being in direct fluid communication with said first chamber of said enclosure;

a gas dispenser in direct fluid communication with said second chamber of said enclosure; and

an exit port in fluid communication with said interior void.

23. The arrangement of claim 22, wherein the gas port is disposed between the inlet and the outlet of the passageway.

24. The arrangement of claim 22, further comprising:

a humidified gas source for providing a humidified gas, said humidified gas source being in fluid communication with said gas dispenser such that said humidified gas is advanced into said gas dispenser and into said second chamber of said enclosure.

25. The method of claim 22, wherein said first orifice comprises a largest orifice in said first partition, and said second orifice comprises a largest orifice in said second partition.

26. The method of claim 25, further comprising at least one additional partition in addition to said first partition and said second partition, each said additional partition having a respective largest orifice, said longitudinal axis dividing said enclosure into a first half and a second half, said largest orifices of said first partition, said second partition, and said at least one additional partition being alternately disposed in said first half and said second half.

**(9) EVIDENCE APPENDIX**

None.

**(10) RELATED PROCEEDINGS APPENDIX**

None.